

AMENDMENTS TO CLAIMS

1-29. (Canceled)

30. (Currently Amended) A layered polymer scaffold comprising a plurality of synthetic biopolymer membranes of from 1 micron to 1 millimeter in thickness which comprise at least one organized feature having at least one dimension of about 10 to 100 microns, wherein said scaffold is microfabricated by a method comprising:

generating an elastomer mold;

directing a ~~polymer~~ hydrogel into the mold, wherein the ~~polymer is a~~ hydrogel comprises a synthetic polymer;

curing the synthetic biopolymer ~~polymer~~ in the mold to form a ~~polymer membrane~~ at least one membrane of the plurality of synthetic biopolymer membranes, wherein said membrane comprises a surface with varying topology including the at least one feature with at least one dimension of about 10 to 100 microns;

removing ~~the cured polymer~~ said membrane from the mold; and

assembling two or more ~~cured polymer of said~~ membranes to provide [[a]] the layered polymer scaffold.

31. (Currently Amended) A microfabricated polymer scaffold comprising at least one membrane ~~a plurality of membranes~~, wherein said at least one each membrane i) comprises a synthetic biopolymer, ii) is from 1 micron to 1 millimeter in thickness and iii) comprises a surface with varying topology including at least one organized feature with at least one dimension of about 10 to 100 microns; ~~and wherein the membranes comprise a biopolymer hydrogel.~~

32-33. (Canceled)

34. (Previously Presented) The polymer scaffold of claim 30, wherein the elastomer is selected from the group consisting of a silicone polymer, a poly(dimethylsiloxane) (PDMS) and an epoxy polymer.

35-37. (Canceled)

38. (Currently Amended) The polymer scaffold of claim 30, wherein the synthetic biopolymer is selected from the group consisting of poly(L-lactic acid; PLLA); poly(DL-lactic acid; PLA); poly(DL-lactic-co-glycolic acid); PLGA ~~hydrogel comprises polyethylene glycol, polyethylene oxide, polyvinyl alcohol, polyvinyl pyrrolidone, polyacrylates, poly (ethylene terephthalate), poly(vinyl acetate), and copolymers and blends thereof.~~
39. (Withdrawn; Currently Amended) The polymer scaffold of claim 30, wherein said method further comprising coating the cured polymer scaffold with a substance that modulates cell adhesion selected from the group consisting of polysaccharides, peptides and proteins ~~that modulate cell adhesion.~~
40. (Withdrawn) The polymer scaffold of claim 39, wherein the substances promote cell adhesion.
41. (Withdrawn) The polymer scaffold of claim 40, wherein the substance is selected from the group consisting of collagen, fibronectin, vitronectin, Arg-Gly-Asp (RGD) and Tyr-Ile-Gly-Ser-Arg (YIGSR) peptides, glycosaminoglycans (GAGs), hyaluronic acid (HA), integrins, selectins and cadherins.
42. (Withdrawn) The polymer scaffold of claim 39, wherein the substances inhibit cell adhesion.
43. (Withdrawn) The polymer scaffold of claim 42, wherein the substances comprise triblock polymers.
44. (Withdrawn) The polymer scaffold of claim 39, wherein the substances are selected from a list consisting of pluronics, surfactants, bovine serum albumin, poly hydroxyethylmethacrylate, polyacrylamide, and polymethymethacrylate.
45. (Currently Amended) The polymer scaffold of claim 30, wherein the method further comprising ~~comprising~~ inducing porosity by contacting the polymer with a particulate leaching agent.
46. (Currently Amended) The polymer scaffold of claim 45, wherein the particular leaching agent is selected from the group consisting of a sugar, a salt and a protein.
47. (Canceled)

48. (Currently Amended) The polymer scaffold of claim 30, wherein the step of assembling further comprises ~~further comprising the~~ attachment of the two or more cured polymer membranes to each other by applying mechanical pressure and heating.

49. (Currently Amended) The polymer scaffold of claim 30, the method further comprising contacting the polymer membranes with cells.

50-52 (Canceled)

53. (Currently Amended) The microfabricated polymer scaffold of claim 31, wherein the ~~hydrogel~~ synthetic biopolymer comprises a polymer selected from the group consisting of poly(L-lactic acid; PLLA); poly(DL-lactic acid; PLA); poly(DL-lactic-co-glycolic acid); PLGA ~~hydrogel comprises polyethylene glycol, polyethylene oxide, polyvinyl alcohol, polyvinyl pyrrolidone, polyacrylates, poly (ethylene terephthalate), poly(vinyl acetate), and copolymers and blends thereof.~~

54. (Withdrawn; Currently Amended) The microfabricated polymer scaffold of claim 31, wherein said at least one membrane is coated ~~further comprising coating the membrane with a substance that modulates cell adhesion~~ selected from the group consisting of ~~polysaccharides, peptides and proteins~~ a polysaccharide, a peptide and a protein that modulate cell adhesion.

55. (Withdrawn; Currently Amended) The microfabricated polymer scaffold of claim 54, wherein the substance promotes ~~substances promote~~ cell adhesion.

56. (Withdrawn) The microfabricated polymer scaffold of claim 55, wherein the substance is selected from the group consisting of collagen, fibronectin, vitronectin, Arg-Gly-Asp (RGD) and Tyr-Ile-Gly-Ser-Arg (YIGSR) peptides, glycosaminoglycans (GAGs), hyaluronic acid (HA), integrins, selectins and cadherins.

57. (Withdrawn; Currently Amended) The microfabricated polymer scaffold of claim 54, wherein the substance inhibits ~~substances inhibit~~ cell adhesion.

58. (Withdrawn; Currently Amended) The microfabricated polymer scaffold of claim 57, wherein the substance comprises a ~~substances comprise~~ triblock polymer ~~polymers~~.

59. (Withdrawn; Currently Amended) The microfabricated polymer scaffold of claim 54, wherein the substance is ~~substances are~~ selected from the group ~~a list~~ consisting of ~~pluronics~~,

surfactants, a pluronic, a surfactant, bovine serum albumin, poly hydroxyethylmethacrylate, polyacrylamide, and polymethymethacrylate.

60. (Previously Presented; Currently Amended) The microfabricated polymer scaffold of claim 31, wherein the at least one membrane is porous.

61. (Currently Amended) The microfabricated polymer scaffold of claim 31, wherein the at least one membrane is a mesh.

62. (Canceled)

63. (Currently Amended) The microfabricated polymer scaffold of claim 31, wherein the at least one membrane further comprises ~~comprising cells attached to the membrane~~.

64. (Currently Amended) The polymer scaffold of claim ~~40~~ 30, ~~comprises~~ further comprising cells.

65. (Currently Amended) The polymer scaffold of claim 30, wherein the at least one organized feature comprises through-holes.

66. (Currently Amended) The microfabricated polymer scaffold of claim 31, wherein the at least one organized feature comprises through-holes.